Evening Lecture

Jointly Organised by
The Joint Branch of RINA & IMarEST
and
Centre for Offshore Research & Engineering (CORE), NUS

“An Update On The Installation And Use Of Zebra Batteries In Marine Applications”
By Lieutenant Commander Neil Benstead
Ministry of Defense, Abbeywood, UK
&
Mr Dave Williamson
Rolls-Royce (Naval Marine), UK

Date: Tuesday 23 May 2006

Time: 6.30pm to 7pm Registration & Refreshments
Talk begins at 7 p.m. and ends at 9 p.m.

Venue: Seminar Room EA-02-11, Faculty of Engineering, National University of Singapore (see attached map)

*** 2 PDU ***

Please see the attached documents for the abstract of the talk and biography of the speaker.

Please confirm with Ms. Juliana by Friday 19 May 2006 via the reply slip.

A/Prof. Choo Yoo Sang
Chairman
The Joint Branch of the RINA and the IMarEST (Singapore)

REPLY SLIP - Fax No. 67791635; Tel No. 65162151; Ms Juliana Binte Miswan, Email: cvejulia@nus.edu.sg

Yes, I would like to attend the talk

Name : ____________________________________________
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ABSTRACT

Previous papers have described how the lead acid battery has been used in submarines for over a hundred years, and why the use of lead acid batteries is becoming more problematic for support, environmental and health reasons.

This paper will present an update on research that is currently being undertaken by Rolls-Royce under the UK MoD’s Submarine Marine Engineering Development Programme, which is investigating the integration and installation of ZEBRA batteries as a submarine main battery. Work currently in progress is in addition to the integration of the system as part of the NATO Submarine Rescue Submersible (NSRS), whilst other research has also investigated the valuable role that ZEBRA could play in distributed power supplies and/or bulk energy storage in submarines and surface ships. This work is key in the demonstration of the system as a safe alternative to lead acid batteries that can meet the power demands of a submarine. The ZEBRA battery has all the attributes required for this role, including maintenance regimes, zero emissions, charging profiles, lifetime and safe final disposal whilst displaying none of the difficulties associated with alternative systems.

This paper therefore has a number of aims. It will look at the benefits of using the ZEBRA system in underwater vehicles and submarines, highlighting the maintenance and support benefits, whilst developing naval technologies. Further, it will discuss the possible use of the system in distributed power or bulk energy storage roles for ships and submarines. It will conclude with a view of the future work that will be required to bring the system into service.

ABOUT THE SPEAKERS

Dave Williamson is a Senior Electrical Design Engineer for Rolls-Royce Naval Marine, a position he has held for 8 years. Prior to joining Rolls-Royce he attended the University of Manchester Institute of Science and Technology (UMIST) as a mature student, having chosen to develop his career from being a commissioning engineer of submarine propulsion and weapon systems. He is currently responsible for developing ZEBRA Battery technology for marine applications.

Lt CDR Neil Benstead is a Future Projects Officer at MoD Abbeywood, UK, where he has worked for nearly two years. Prior to this post he attended the University of Southampton followed by appointments at sea and in training establishments. In 2004 he completed a Masters of Science degree at University College London. His current responsibilities include...
in-service support of generators and the development of bulk energy storage systems for ships and submarines.